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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/375,610 08/17/99 WANG Y B-1484

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EXAMINER

PARSA, J

ART UNIT

PAPER NUMBER

1621

5

DATE MAILED:

06/20/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
**09/375,610**

Applicant(s)

**Wang et al**

Examiner

**J. Parsa**

Group Art Unit  
**1621**



☐ Responsive to communication(s) filed on \_\_\_\_\_

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claim

☒ Claim(s) 1-6 and 10-17 is/are pending in the applicat

Of the above, claim(s) 1-6, 14, and 15 is/are withdrawn from consideration

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 10-13, 16, and 17 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☒ The ~~proposed~~ drawing ~~correction~~, filed on Aug 17, 1999 is ☒ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☒ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## DETAILED ACTION

### *Election/Restriction*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-6,14 and 15, drawn to a catalyst structure, classified in class 502, subclass 300+.
  - II. Claims 10-13,16 and 17, drawn to a Fischer-Tropsch synthesis process, classified in class 518, subclass 700+.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MEP. § 806.05(h)). In the instant case the product as claimed can be used in a materially different process such as catalyst for the purification of nitrogen oxides..
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

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4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Stephen May on June 6, 2000 a provisional election was made with traverse to prosecute the invention of Group II, claims 10-13, 16 and 17.

Affirmation of this election must be made by applicant in replying to this Office action.

Claims 1-6, 14 and 15 are withdrawn from further consideration by the examiner, 37

CAR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CAR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CAR 1.48(b) and by the fee required under 37 CAR 1.17(I).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 10-13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herskowitz (USP 5,652,193).

Applicants' claimed invention is directed to a Fischer-Tropsch synthesis reaction in the presence of a catalyst having a porous structure with a porous surface area. An interfacial layer is placed upon the first surface area which has pore size less than said first pore size . The Fischer-Tropsch catalyst is selected from the group consisting of cobalt, ruthenium, iron, rhenium, osmium and combinations thereof. Passing a feed stream having a mixture of hydrogen gas with carbon monoxide through the said catalyst structure, and heating the catalyst structure to at least 200 °C at an operating pressure. The feed stream has a residence time less than 5 seconds, thereby obtaining a product stream of at least 25% conversion of carbon monoxide and at most 25% selectivity toward methane.

Herskowitz teaches a process for converting hydrogen and carbon monoxide to heavy hydrocarbon in a fixed bed reactor by a catalytic reaction. The method includes contacting the hydrogen and carbon monoxide in the reactor at reaction conditions with a supported catalyst.

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The support includes an inert or hollow core and an outer layer of porous inorganic refractory oxide. The outer layer has a thickness determined so as to optimize CO conversion to heavy hydrocarbons so that conversion to methane is maintained at a predetermined level. The thickness is determined by relating the rate of diffusion of the CO and hydrogen to a rate of reaction in the porous inorganic oxide for a predetermined support geometry, partial pressure and temperature. A metal catalyst ( e.g. cobalt or ruthenium) on a support (e.g. titania or silica) promoted by different metals (rhenium, hafnium and others) are used for synthesis of hydrocarbon from mixture of carbon monoxide and hydrogen (see col. 1, line 65 through col. 2, line 18 and Table 2 for the methane selectivity and CO conversion).

The reference does not disclose the residence time and the pore size of the catalyst structure (support) including the pore size of the outer layer of porous inorganic refractory oxide. However, the reference teaches that the methane selectivity depends on the depth in the pellet, by decreasing the depth of the outer layer, the CO conversion to methane is significantly decreased (see col. 2, lines 28-35). Since the reaction conditions for the Fischer-Tropsch synthesis reaction taught by Herskowitz (T, P and molar ratio of hydrogen to carbon monoxide ) fall within the range of the instant claimed invention one would expect to obtain a similar residence time compared to the applicants' claimed invention. Therefore, it is well within the level of one having ordinary skill in the art to find the optimum pore size of the catalyst through a routine experimentation to minimize the selectivity of CO conversion to methane.

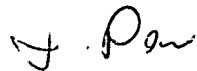
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10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

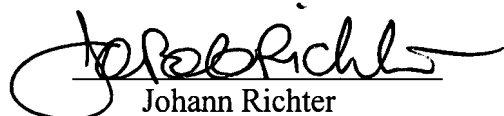
Kleefisch et al disclose a composite material for membrane reactors which includes a gas-tight ceramic, a porous support, and interfacial zone therebetween. More particularly, this process relates to composite material using a ceramic membrane formed on a porous support comprising a metallic alloy to provide an interfacial zone identifiable by a gradient of composition in at least one metallic element across the interfacial zone between the dense ceramic membrane and the porous support. This catalyst is used for the production of synthesis gas comprising carbon monoxide and hydrogen.

Any inquiry concerning this communication from the examiner should be directed to J. Parsa, whose telephone number is (703)308-4615. The Examiner's normal work hours are Monday-Friday from 8:00 a.m. to 4:30 p.m. If Examiner is not in, please leave a message. Your call will be return as soon as possible. Any general inquiry of a general relating to the status of this application should be directed to the Group 1600 receptionist whose telephone number is (703)308-1235. The Examiner's supervisor, Johann Richter, may be reached at (703)308-4532. Communications may now be transmitted via FAX directly to group 1600. The group 1600 FAX machine number is (703)308-4556.

J. Parsa



June 14, 2000



Johann Richter  
Supervisory Patent Examiner  
Technology Center 1600